The Replacement of MTBE with Ethanol in Gasoline Fact Sheet

For years, most of the gasoline sold in Rhode Island has contained methyl tertiary butyl ether (MTBE). It was first added to gasoline in the late 1970's as an octane booster when leaded gasoline was phased out. In the 1990's it was added in a higher concentration to fulfill the requirement in the Clean Air Act that reformulated gasoline contain oxygenates (oxygen containing compounds) to maximize combustion, resulting in less emission of air pollutants. Advances in automobile technology in recent years have all but erased the advantages of adding oxygenates to gasoline for the purpose of pollution control. The 2005 Federal Energy Policy Act removed the oxygenate requirement but mandated the increased use of renewable fuel, such as ethanol. Because MTBE is so soluble and so persistent in groundwater, releases of gasoline containing MTBE have resulted in major impacts, such as the loss of the Pascoag drinking water supply. This led to the Rhode Island legislature passing a law that prohibits the sale of gasoline containing MTBE as of June 1, 2007 (RI General Laws, Chapter 31-37-7.1).

The result of all this is that ethanol is essentially replacing MTBE in gasoline. While gasoline may be formulated without ethanol, we expect that most of the gasoline that will be sold in Rhode Island will be gasoline which contains 10% ethanol. Many major petroleum manufacturers are replacing MTBE with ethanol in gasoline this spring. There are many concerns for both consumers and owners of gasoline storage facilities in the transition to ethanol gasoline. This fact sheet will discuss some of those concerns.

Concerns for the Consumer:

Vehicles now sold in the United States are designed to be able to use a 10% ethanol blend gasoline. There may be compatibility problems with vehicles manufactured before 1980. Some seals and hoses may deteriorate more rapidly due to exposure to the ethanol blend gasoline. There also may be compatibility problems with fiberglass tanks in boats manufactured before the middle of the 1980's. Manufacturers should be contacted for more information.

There should be no problem using ethanol blend gasoline in equipment with motors such as snow blowers, lawn mowers, chainsaws, etc. However, you should review the owner's manual before using ethanol blend gasoline in such equipment.

Concerns for Owners of Gasoline Storage Facilities:

Before storing ethanol blend gasoline in the underground storage tanks at your facility the following concerns must be addressed:

Cleaning - Ethanol is a solvent that can dissolve sludge, encrusted materials, wall coatings etc. Pump filters and automobile fuel lines and filters can then get clogged if particles of these materials are in the gasoline.

- Storage tanks have to be emptied and thoroughly cleaned before they are used to store ethanol blend gasoline.
- Special pump filters are needed to remove any particulate matter from the gasoline before it can cause problems for your customers.

Compatibility - Some materials in tank systems installed before 1981 may not be compatible with ethanol blend gasoline. The rubber, urethane seals, tank linings, tank repair materials, fiberglass or other materials used in these tank systems may soften or otherwise fail when exposed to ethanol blend gasoline.

- Check with the manufacturers of your tanks, piping, pumps and any other components to be sure they are compatible.

Water – Ethanol is highly soluble in both water and gasoline. However, a condition called phase separation, where the water and ethanol drops out of the gasoline forming a layer below, can occur with only a very small amount of water in your tank. This results in two separate liquids, and as the octane of the gasoline is lowered to an unknown level, neither the ethanol/water nor the gasoline is then an acceptable motor fuel. If phase separation occurs you will probably have to empty the tank and properly dispose of the contents. It is critical then to keep water out of systems storing ethanol blend gasoline. In order to minimize the chance of phase separation occurring, the following actions are critical.

- All water must be removed from the tank before storing any ethanol blend gasoline.
- The tank must be checked frequently for the presence of water. Checks should be conducted at least weekly and before and after product delivery. On the gauging stick, you must use a special water finding paste that is designed to detect water in ethanol blended gasoline. If there is any water in the tank, it must be immediately removed and its source should be investigated and corrected.
- Install water sorbing dispenser filters to minimize the water content of the ethanol blend gasoline.

For additional information you may contact the Underground Storage Tank Program at (401) 222-2797 or ust@dem.ri.gov or refer to the websites listed below:

Connecticut Department of Environmental Protection website: http://www.dep.state.ct.us/air2/mtbe/

New Hampshire Department of Environmental Services website:
http://www.des.state.nh.us/orcb/ustprog_info.htm (click on “ethanol transition”)
Contains useful additional detail on the above discussed concerns and manufacturers of ethanol/water paste and water sorbing dispenser filters.

New England Interstate Water Pollution Control Commission website:
http://www.neiwpcc.org/PDF_Docs/ethvol3.pdf